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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/633,156	08/04/2003	Robert J. Howard	FE-00636	5451

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Lockheed Martin Corporation  
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EXAMINER
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WYSZOMIERSKI, GEORGE P

ART UNIT	PAPER NUMBER
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1742

DATE MAILED: 10/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/633,156	<b>Applicant(s)</b> HOWARD, ROBERT J.	
	<b>Examiner</b> George P. Wyszomierski	<b>Art Unit</b> 1742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-33 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 26-33 is/are allowed.
- 6) ☒ Claim(s) 1-8, 10-21 and 23-25 is/are rejected.
- 7) ☒ Claim(s) 9 and 22 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>8/4/03</u> . | 6) <input type="checkbox"/> Other: ____.  |

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1. Claims 14-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Independent claim 1 is directed to a "system" comprising several apparatus parts. Dependent claims 14-17 appear to be directed to some process of using that system, i.e. they do not further define or limit the system itself or any of its individual parts. Clarification is required.

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-5, 10, 18, 19 and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Fujiwara (U.S. Patent 5,215,456).

Fujiwara discloses a system which includes a memory metal such as Nitinol, a fuel-oxidizer mixture, and a catalyst. The examiner's position is that the latter two materials in the prior art are located in "the proximity of" or introduced into "the vicinity of" the memory metal, in accord with the instant claims. The Fujiwara system may further include a reaction initiator such as an electric discharge spark in accord with instant claims 2, 3, 4 and 19; see Fujiwara column 4, line 53. With regard to claims 10 and 23, while Fujiwara does not specifically state that the

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fuel-oxidizer mixture is applied to a surface of the memory metal, the examiner's position is that because this mixture in the prior art may be in gaseous form, then it would inherently be applied to any and all surfaces in its vicinity, by a natural process. Thus, all aspects of the instant claims are held to be either fully met or inherent in the disclosure of Fujiwara.

4. Claims 1-6, 8, 14, 15, 18-21 and 24 are rejected under 35 U.S.C. 102(e) as being anticipated by Hirsch et al. (U.S Patent 6,924,055).

Hirsch discloses a system including a shape memory metal such as Nitinol, a fuel-oxidizer such as methanol and oxygen, and a catalyst such as platinum. The examiner's position is that the latter two materials in the prior art are located in "the proximity of" or introduced into "the vicinity of" the memory metal, in accord with the instant claims. The Hirsch disclosure includes a using a reaction initiator such as an electric current passed through the memory metal; see Hirsch column 9, lines 10-12. With respect to instant claims 14, 15, and 24, Hirsch column 9, lines 1-37 discloses these aspects of the claimed invention. Thus, the invention as presently claimed is held to be fully anticipated by Hirsch et al.

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 6-8, 11-14, 16, 17, 20, 21 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujiwara.

Fujiwara, discussed in item no. 3 supra, does not specifically disclose the limitations as defined in the instant claims. However, these limitations are not seen as defining an invention patentably distinct from the prior art because:

a) With regard to instant claims 6, 8, 20 and 21, the materials recited in the instant claims are nothing more than the most commonly used fuel-oxidizer mixtures and catalyst materials, respectively. It thus would have been an obvious expedient to one of ordinary skill in the art to employ the presently claimed materials in the Fujiwara structure.

b) With regard to claim 7, Fujiwara column 3, lines 24-26 discloses a gas mixture comprising the fuel gas and air, which would appear to meet the definition of a "monopropellant" fuel-oxidizer mixture.

c) With respect to claims 11-13, a change in shape of a particular part of a known prior art apparatus does not give rise to patentability in the absence of some unobvious effect attributed to the change in shape.

d) With respect to claims 14, 16 and 25, if the prior art disclosure uses the shape memory material as a "heat responsive member", implying that one would use it for its known ability to expand and contract upon application and removal of heat. Thus, to carry out the step(s) as defined in the instant claims would be considered an obvious implication of what is disclosed by Fujiwara.

e) With respect to claim 17, the question of whether the reaction is self-sustaining or not would depend largely upon the composition of the fuel and the materials it comes in contact with. One of ordinary skill in the art would easily be able to select a fuel gas in the prior art such that the reaction is not self sustaining.

Consequently, the disclosure of Fujiwara is held to create a prima facie case of obviousness of the presently claimed invention.

7. Claims 7, 10-13, 16, 17, 23 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirsch et al.

Hirsch et al., discussed in item no. 4 supra, does not specifically disclose the limitations as recited in the instant claims. However,

a) With respect to claim 7, the mixture of methanol and oxygen used in the prior art appears to be in one piece, i.e. equivalent to the presently claimed "monopropellant" fuel-oxidizer mixture.

b) With regard to claims 10 and 23, it would appear that at least some of the fuel flowing in the fuel flow path **65** of Hirsch would contact the memory material **64a** and **64b** used in the prior art, as described in Hirsch column 8, lines 56-65 and Figures 4A and 4B.

c) With respect to claims 11-13, a change in shape of a particular part of a known prior art apparatus does not give rise to patentability in the absence of some unobvious effect attributed to the change in shape.

d) With regard to claims 16, 17 and 25, the comments made in item 6d and 6e supra apply in this instance as well (the exception being that the fuel in Hirsch is generally liquid as opposed to the gaseous fuel used by Fujiwara).

Thus, the disclosure of Hirsch et al. is held to create a prima facie case of obviousness of the presently claimed invention.

8. Claims 9 and 22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, and claims 26-33 are allowable over the prior art of record. The prior art does not disclose or suggest a process or system as claimed, and in which a catalyst is applied to a surface of a memory metal.


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9. The remainder of the art cited on the attached PTO-892 and 1449 forms is of interest. This art is held to be no more relevant to the claimed invention than the art as applied in the rejections, supra.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to George Wyszomierski whose telephone number is (571) 272-1252. The examiner can normally be reached on Monday thru Friday from 8:00 a.m. to 4:30 p.m. Eastern time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King, can be reached on (571) 272-1244. Effective July 15, 2005, all patent application related correspondence transmitted by facsimile must be directed to the new central facsimile number, (571)-273-8300. This new Central FAX Number is the result of relocating the Central FAX server to the Office's Alexandria, Virginia campus.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
GEORGE WYSZOMIERSKI  
PRIMARY EXAMINER  
GROUP 1700

GPW  
October 25, 2005